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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/654,922	09/05/2000	Orly Yadid-Pecht	06816/021002CIT2386	9700
20985	7590	07/23/2004	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			TILLERY, RASHAWN N	
			ART UNIT	PAPER NUMBER
			2612	
			DATE MAILED: 07/23/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/654,922

Applicant(s)

YADID-PECHT ET AL.

Examiner

Rashawn N Tillery

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-10, 14-16 and 19-25 is/are rejected.
- 7) ☒ Claim(s) 11-13, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

If applicant desires priority under 35 U.S.C. 119(e) based upon a previously filed application, specific reference to the earlier filed application must be made in the instant application. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications. This should appear as the first sentence of the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet. The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. ____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage

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commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Claim Objections

Claim 2 is objected to because of the following informalities: In claim 2, pixels are said to accumulate charge beginning at a first time. At this first time, a first shorter integration time begins and a second longer integration time also begins. At a second time, the first shorter integration time ends. At a third time, subsequent to the second time, the second longer integration time ends. Applicant claims in the last line of the

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claim that the second longer integration time "ends at a third time subsequent to said first time." Appropriate correction is required.

Claims 9 and 19 are objected to because of the following informalities: claim 9 depends from canceled claim 1; and claim 19, which is a duplicate of claim 9, depends from claim 9. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 2-9 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Komiya et al (US5264940).

Regarding claim 2, Komiya discloses, in figure 21, a method comprising:

forming a two-dimensional array of pixels;

allowing the pixels to receive light representing an image to be detected by

allowing the pixels to accumulate light beginning at a first time (RST); and

reading out each of the pixels at least at both of a first shorter integration time (t1), which begins at the first time, and ends at a second time (READ) and a second longer integration time (t2), which begins at the first time and ends at a third time (READ/RST) subsequent to the [second] time (see col. 14, line 46 to col. 15, line 17).

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Regarding claim 3, Komiya discloses combining information from the readouts from the first shorter integration time with information from the readouts from the second longer integration time to form a composite readout (see line 1 of col. 15).

Regarding claim 4, Komiya discloses the reading out comprises reading out an entire row of pixels at each of the first shorter integration time and the second longer integration time (inherent feature).

Regarding claim 5, Komiya discloses the reading out comprises reading out the pixels into a first buffer representing the shorter integration time and reading out the pixels into a second buffer representing the longer integration time (the examiner notes that pixels of both integration times are read into frame memory 54).

Regarding claim 6, Komiya discloses the pixels are non-destructively read out and the reading out comprises reading out the pixels at the shorter time and the second at the longer time (see col. 14, lines 46-62).

Regarding claim 7, Komiya discloses the reading out comprises reading out the pixels from the shorter integration time into the same buffer (frame memory 54).

Regarding claim 8, Komiya discloses, in figure 22, reading out each of the pixels at a third integration time (Komiya teaches 5 readouts are performed during one exposure period).

Regarding claims 9 and 19, Komiya discloses the pixels are active pixels (inherent feature).

2. Claims 10, 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilder et al (US5455621).

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Regarding claim 10, Wilder discloses a method comprising:

allowing an array of pixels to receive light representing an image to be detected;

and

reading two separated rows of pixels in each single row readout process (Wilder is capable of reading out a single pixel or a multiple rows or columns at a time; see col. 6, lines 3-47).

Regarding claim 14, Wilder discloses reading an entire row at each reading time (see claim 10 above).

Regarding claim 16, Wilder discloses reading a third row of pixels during each single row readout process (Wilder teaches a device for randomly addressing individual pixels and selectively varying the number of pixels that can be read out on any one reading cycle).

2. Claims 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Morimura (US5455621).

Regarding claim 20, Morimura discloses, in figures 2A and 3, a system comprising:

a semiconductor substrate defining a two-dimensional array of pixels (20), each of the pixels formed with a photoreceptor portion (21) therein, and at least one active readout portion (22) therein,

a readout control part, controlling the pixels to allow the pixels to receive light representing an image to be detected, and to control the pixels to readout information from the pixels representative of light reception for a first integration time (CS1), and a

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second integration (CL1) time longer than the first integration time, such that each pixel provides light output integrated over both of the first and second integration times (see col. 5, line 36 to col. 6, line 63).

Regarding claim 21, Morimura discloses, in figure 8A, the readout control part also controls the pixels to accumulate light for a third integration time (Morimura teaches an example where the charge accumulation period could be divided into three periods- a short period CS4, a medium period CM4 and a long period CL4).

Regarding claim 22, Morimura discloses, in figure 1, an image information combiner (6), which combines information from the first shorter integration time with information from the second longer integration time, to produce composite information about the image (Morimura teaches an adder for synthesizing the image data accumulated at different time periods).

Regarding claim 23, Morimura discloses, in figure 20A, a first buffer (S30), on the semiconductor substrate, receiving information indicative of the light integrated for the first integration time (S20), and a second buffer (S70), receiving information indicative of the light integrated for the second integration time (S60).

Regarding claim 24, Morimura discloses, in figure 3, a buffer (23) receiving information indicative of the light reception for the first integration time and indicative of the light reception for the second integration time.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilder in view of Morimura.

Regarding claim 15, Wilder teaches a device for randomly addressing individual pixels and selectively varying the number of pixels that can be read out on any one reading cycle. Wilder does not explicitly disclose a method for increasing a dynamic range of information from a pixel by combining information from a first and second pixel with different integration times. Morimura teaches a method for producing an image with a wide dynamic range using an imaging element in which periods for accumulating charges can be varied. Morimura reveals that it is well known in the art to utilize an adder for synthesizing the image data accumulated at different time periods. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilder's device by implementing Morimura's teachings. One would have been motivated to do so in an effort to produce an image having a wide dynamic range without resulting in white saturation or black level cutoff.

2. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morimura.

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Wilder does not expressly disclose a CDS system which destructively reads out pixels. However, Official Notice is taken that it is well known in the art that photosensors may be of any type- destructive, non-destructive, MOS, etc. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a CDS system with any known type of photosensor as a matter of design choice as they all provide various advantages and disadvantages.

Allowable Subject Matter

1. Claims 11-13 and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 11, the prior art does not teach or fairly suggest a method comprising allowing pixels to receive light and reading two separated rows of pixels in each single row readout process, wherein

the two separated rows of pixels represent a first row of pixels representing the image integration for a shorter integration time, and a second row of pixels representing the image integration for a longer integration time.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kamishima et al, Keller et al, Kinoshita et al, Schanz et al and Berger et al teach imaging devices where the first and second exposures are

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adjustable. Ueda, Hashimoto et al and Fossum et al teach photosensors of non-destructive and destructive type. Takemura teaches an imager capable of varying integration times. Nishizawa et al teach an image signal readout method for an imager. Ikeda teaches combining image signals in order to extend dynamic range. Krymski teaches an imager with long and short exposure times. Fossum et al teach an imager with long and short exposure times.

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rashawn N Tillery whose telephone number is 703-305-0627. The examiner can normally be reached on 9AM-6:30PM.

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3. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RNT


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600